INSTR. DIV. COPY.

INSTRUCTION MANUAL

Type 1537-A
PHOTOELECTRIC PICKOFF

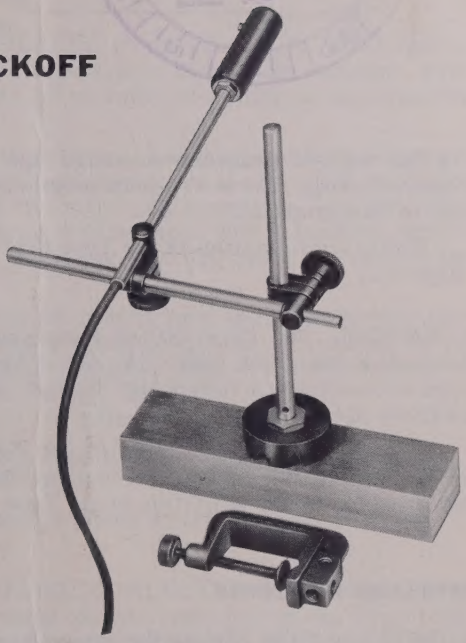

Figure 1.

1 DESCRIPTION.

1.1 GENERAL. The Type 1537-A Photoelectric Pickoff is used to obtain trigger pulses from a moving object for the synchronization of an electronic stroboscope with the object. The pickoff consists of a cylindrical optical system and a photocell. Variations in the amount of light reaching the photocell produce electrical pulses. These pulses are applied to the input of the Type 1538 Strobotac® electronic stroboscope or the Type 1539 Stroboslave.

An extremely flexible linkage system, consisting of three rods and two clamps, permits the head of the pickoff to be locked in practically any position.

The complete pickoff includes the following items (see Figure 1):

- Pickoff head assembly, consisting of pickoff head, clamp, 1/4-inch hollow rod, cable, and phone plug;
- Intermediate rod, 5/16-inch diameter at one end, 1/4-inch diameter at the other;
- Base rod, with a threaded end that can be screwed into either a C clamp or a magnetic holding device (both supplied);
- Adjustable clamp, to attach the base rod to the intermediate rod;
- A 1/8-inch-diameter rod, for use as a wrench to tighten the base rod in either the C clamp or the magnetic holding device, whichever is more convenient.

COMPONENTS

Ref No	Description	Part No
R101	Resistor, Composition, 56 kΩ ±5%	6099-3565
PC101	Photocell	8210-1094
PL101	Phone Plug	1537-2000

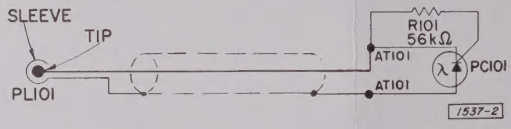

Figure 2. Schematic diagram of the Photoelectric Pickoff.

• Two rolls of pressure-sensitive tape are provided, one reflecting and one nonreflecting. These are to be attached to the rotating object, as needed (Refer to Paragraph 2.2).

The circuit diagram of the Type 1537-A Photoelectric Pickoff is shown in Figure 2.

1.2 PURPOSE. The Type 1537-A Photoelectric Pickoff is intended to look directly at a source of light. The use of reflecting tape is of course possible but necessitates a rather high level of light. (Refer to Paragraph 2.2 and sensitivity specifications.)

In cases where the source of light, reflected or direct, is low, the Type 1536-A Photoelectric Pickoff is recommended because of the greater sensitivity provided by the amplifier in the Type 1531-P2.

2 OPERATING PROCEDURE.

2.1 INSTALLATION. Select the proper mounting device (either the C clamp or the small magnet) and screw the base rod into it. Insert the 1/8-inch-diameter rod in the hole in the mounting device and use it as a wrench to tighten the base rod. A choice of any of three tapped holes at right angles to each other in the C clamp provides flexibility in the placement of the pickoff head.

The pickoff head assembly mounts directly on the base rod by means of a clamp on the assembly. The intermediate rod should be used when greater distance is to be covered between the point of mounting and the pickoff head, or when more adjustment is needed to position the head properly. The separate clamp is used to attach the intermediate rod to the base rod. Release both clamps by loosening the knurled knob. Insert the 1/4-inch section of the intermediate rod in the small hole in the clamp (farthest from the knob). Pressure on the knob will open the hole. Then insert the base rod in the large hole in the clamp. Adjust the pickoff head to the desired position and turn the knurled knob clockwise to lock both rods in place. Loosen the knob slightly for minor adjustments. All clamps should be tightened securely to prevent movement of the pickoff due to vibrations.

2.2 OPERATION. Insert the phone plug at the end of the cable into the proper jack marked INPUT, on the front panel of the Type 1538 Strobotac electronic stroboscope or the Type 1539 Stroboslave.

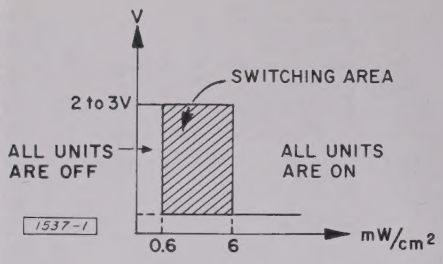

Figure 3. Sensitivity of the Photoelectric Pickoff: irradiance needed to switch the pulse on and off.

Figure 3 is in effect a specification of sensitivity, it shows that in order to trigger the Type 1537-A Photoelectric Pickoff the effective irradiance has to be greater than 6 mW/cm^2 to switch the pulse on and less than 0.6 mW/cm^2 to switch it off.

For applications where sufficient light is available, reflected light can be used. If the rotating object whose speed is to be measured is not highly reflective, attach a small piece of the reflecting tape to it. Use the black tape if the obiect is highly reflective. For surfaces with a medium reflectivity, attach a small piece of the reflecting tape and cover the rest of the periphery with black tape.

The minimum distance between the pickoff head and the reflecting surface that will provide an adequate signal depends upon the reflectivity of the rotating surface and the ambient light. The front face of the head should be parallel to the reflecting surface or source.

The following data can be used for reference:

A GE #330 lamp (1.1 W, 14 V, .08 A) will operate the Type 1537-A Photoelectric Pickoff without any auxillary lenses or reflectors, at 1/2 inch.

A 40 W lamp without reflector provides an irradiance of 6 mW/cm^2 at a distance of 3 inches.

2.3 USE WITH THE TYPE 1538 STROBOTAC ELECTRONIC STROBOSCOPE. The Photoelectric Pidkoff plugs directly into the input jack of the Type 1538. The dial of the Type 1538 has to be turned clockwise to synchronize on the leading edge of the positive pulse. For more details refer to the operating instructions of the Type 1538.

2.4 USE WITH THE TYPE 1539 STROBOSLAVE. The Photoelectric Pickoff plugs directly into the INPUT jack of the Type 1539.

3 SERVICE AND MAINTENANCE.

We warrant that each new instrument manufactured and sold by us is free from defects in material and workmanship and that, properly used, it will perform in full accordance with applicable specifications for a period of two years after original shipment. Any instrument or component that is found within the two-year period not to meet these standards, after examination by our factory, Sales Engineering Office, or authorized repair agency personnel, will be repaired or, at our option, replaced without charge, except for tubes or batteries that have given normal service.

If, for any reason, you feel that your unit does not operate properly, write to our Service Department, giving full information of the trouble and of steps taken to remedy it. Our Service Engineers will assist in any way possible.

SPECIFICATIONS

Operating Rate: Greater than 2500 pulses/s.
Sensitivity: Effective irradiance must be at least 6.0 mW/cm² to switch on, less than 0.6 mW/cm² to switch off, at 1 micron wavelength.
Power Required: 3 to 25 V dc; 0 to 100 μA depending on operating rate. Power is supplied by instrument with which it is used.
Accessories Supplied: 10-ft roll of ⅜-in black tape, 10-ft roll of ⅜-in silver tape, carrying case.

Mounting: C-clamp (capacity 1 5/16 in, flat or round) or 1½-in magnet, both supplied.

Dimensions: Pickoff head, 11/16-in dia, 2 in long. Linkage consists of two 5/16-in diameter stainless-steel rods, 6 and 6¼ in long, and adjustable connecting clamp. Cable is 8 ft long, terminated in phone plug.

Net Weight: 1½ lb (0.7 kg).

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